

SPECTROSCOPIC FITS TO THE ALMA SCIENCE VERIFICATION BAND 6 SURVEY OF THE ORION HOT CORE AND COMPACT RIDGE

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Individual spectral lines in astrophysical data are ordinarily assigned by comparison with line frequency and intensities predicted by catalogs. Here we seek to fit the spectra of specific sources within Orion KL that are first selected by ALMA's angular resolution and then by Doppler velocity class. For each molecule in this study, astrophysical reference lines are selected. Subsequent analyses of individual velocity components provide the astrophysical column density and temperature for these velocity regimes. These column densities and temperatures are then combined with results from the complete experimental spectra obtained from our laboratory spectra to model the molecule's contribution to the entire astrophysical spectrum [1]. Effects due to optical thickness and spectral overlap are included in the analyses. Examples for ethyl cyanide in the hot core and methanol in the compact ridge will be presented. [1] J. P. McMillan, S. M. Fortman, C. F. Neese, and F. C. De Lucia, "The Complete, Temperature Resolved Experimental Spectrum of Methanol (CH₃OH) between 214.6 and 265.4 GHz," *Astrophys. J.*, vol. 795, pp. 56(1-9), 2014.